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ABSTRACT

The impact of financial assistance on students' decisions on whether to discontinue college studies was investigated. Students enrolled in either two- or four-year institutions were included. Grants, loans, and college work-study funds were considered as financial aid. A casual model was used to illustrate how withdrawal was affected by interacting variables, and path analysis was used to test the model's validity. The following variables were assessed: socioeconomic status, race, sex, academic aptitude, high school grade point average, occupational aspiration, degree level goal, college performance, institutional characteristics, and receipt of financial aid. The primary data source was the National Longitudinal Study of the High School Class of 1972. Of the sample of 4,838 students who entered college in the fall 1972, 36.4 percent were identified as dropouts. It was found financial aid was linked to completion of degrees, and was the third most important direct influence on persistence. Two variables had stronger direct effects on persistence: high school grade point average and degree-level goal. (SW)

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# DOES FINANCIAL AID ENHANCE UNDERGRADUATE PERSISTENCE?

by

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Students drop out of college for many reasons. When asked students give a variety of explanations for their departures. Some cite academic matters as their primary reason for leaving. For example, they drop out because of poor grades, dissatisfaction with the curriculum, or boredom with courses (Pantages & Creedon, 1978). Others cite motivational problems, including uncertainty about educational and occupational goals, lack of interest in studies and inability or unwillingness to study as the major reason for withdrawing (Demitroff, 1974; Angers, 1961). Others students cite personal factors such as emotional problems, problems of adjustment to college life, marriage,

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or family illness as their primary reason for dropping out (Panos & Astin, 1968; Demitroff, 1974). Still others cite dissatisfaction with the size of the institution, the social or academic environment, or the college's regulations as a reason for withdrawing. (Ironside, 1979; Panos & Astin, 1968). Another reason given by students for withdrawing is to get a full-time job (Ramist, 1981). Finally, students often cite financial difficulties as their reason for dropping out. Pantages and Creedon (1978) reported that the second most frequently cited reason given by students for withdrawing was financial difficulties (academic matters was the most frequently cited reason). Bayer (1968) and Panos and Astin (1968) found that financial reasons ranked high in importance for both male and female dropouts.

The relationship between student attrition and financial aid is of particular interest to higher education administrators, policy makers, and reseachers. In this study I examine the impact of financial assistance on students' decisions on whether or not to withdraw from higher education as a whole and not from any particular institution. For purposes of this paper, I define financial assistance as the receipt of grants, loans, and/or college work-study funds. I do not attempt to disentangle the effects of specific types of aid. In most instances, students receive financial aid packages which include some combination of these various means of assitance. Rarely, do

students receive only one form of assistance.

Research Question

My primary question concerns the relationship between the receipt of financial assistance and student persistence: Does financial aid enhance persistence? Specifically I examine whether the receipt of aid affects whether a student will remain in college or dropout. In order to examine this question I construct a causal model that depicts the paths which influence withdrawal decisions. My model was created after an extensive review of the attrition literature (Terkla, 1981). This model provides a conceptual framework and illustrates how numerous variables interact to affect dropout behavior. I use path analysis techniques to test the validity of my model and present the subsequent findings.

Data

The primary source of data for this study is the National Longitudinal Study (NLS) of the High School Class of 1972. The first data collection was in the spring of 1972. At that time 19,001 high school seniors from 1,061 high schools were surveyed (Riccobono, Henderson, Burkheimer, Place & Levinsohn, 1981). Information came from five sources: 1) a student questionnaire, 2) a test battery, 3) a school record information form, 4) a school

questionnaire, and 5) two counselor questionnaires.

Four follow-up surveys were conducted: the first in 1973-74, the second in 1974-75, the third in 1976-1977, and the fourth in 1979-1980.[2] The four follow-up surveys collected data on college enrollment status, type of academic program, financial support, academic achievement, employment status, and a wide range of attitudes.[3] As a result there are over 3500 variables in the current data set. The overall response rate to these four follow-up surveys was very high: 91 percent, 93.3 percent, 92.1 percent and 89.3 percent respectively. A total of 12,980 individuals (78 percent of the base year respondents) provided information on all questionnaries. Of the original sample members, approximately half entered college in the fall of 1972. Of these approximately 5,000 responded to the full set of instruments I use: the base year student

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2. Prior to the first follow-up, an additional 4,450 individuals were added to the base-year lists. However, there are no test data available for these individuals.

3. Since the survey instruments were longitudinal, unadjusted student weights were calculated for all students sampled (Riccobono et al.; 1981). In addition, several sets of adjusted weights were computed. Using the computed weights would result in responses that reflect the size of the total population in question (i.e. the entire high school class of 1972). In order to avoid making the sample estimates appear more accurate thatn they actually are, I reduced the weights proportionally until the total weighted sample size equaled the actual sample size. All the statistics in this study are so weighted.

questionnaire; the first, second, third and fourth follow-up questionnaires; the test battery, the school questionnaire; and the student school record information form.

Dropout Definition

An issue of primary importance to this research is the appropriate definition of dropout used. The definition of dropout employed will influence the results of any analysis. Unfortunately, there is no universally accepted definition for either "dropout" or "attrition." The following list provides a brief description of five widely used definitions:

1. Failure to Advance. This measure defines students as dropouts when they do not advance from year to year in an orderly fashion at a given college. (This measure is frequently used in two-year studies which examine progression from the freshman to sophomore year).

2. Failure to Return. This measure defines student as dropouts when they fail to enroll in the same college on a term-to-term basis.

3. Failure to Enroll. This measure defines students as dropouts only when they miss a semester or quarter because they failed to enroll at any institution.

4. Failure to Complete. This measure defines students as dropouts when they fail to complete a degree within ten years (or some such term) of original matriculation.

5. Intentional Dropout. This measure defines students as dropouts when they leave college with no intention of returning.

For puposes of this study I use a slightly modified version of definition 4, failure to complete. I define a dropout as any student who (1) enrolled in an academic

program at a two-year or a four-year institution by October 1972, (2) had not obtained a bachelor's degree or an associate's degree by May 1979, and (3) was no longer enrolled in college in May 1979. Students who transfer from one institution to another are not classified as dropouts. Students who received associate's degrees and subsequently enrolled in four-year institutions are treated identically to their counterparts who originally enrolled in four-year institutions. In addition students who are prolongers -- that is, who take one or two years off -- are not classified as dropouts.[4]

Of the 4,838 individuals who originally entered college in the fall of 1972, I identified 2,685 (55%) as completers, 1,763 (36.4%) as dropouts and 390 (8.1%) as prolongers.[5]

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4. Estimates of attrition rates vary if determination is made after one year, four years, five years, or ten years. For example, the El-Khawas and Bisconti (1974) ten year longitudinal data on the class of 1961 reported that 53 percent of their sample graduated after four years and that 80 percent received a degree within ten years of matriculation. Thus, it is possible that this definition will yield a slight overestimate of the true attrition rate, since prolongers who happened not to be enrolled in 1979 are counted as dropouts.

5. Approximately 54 percent (about 10,000 students) attended some form of postsecondary school in the fall of 1972 (Burkheimer & Novak, 1981). The number of individuals in my sample is some what smaller. This is a direct result of several decisions I made. First, I chose to examine only students who were enrolled in either two-year or four-year institutions. Thus, I eliminated those individuals who were enrolled in vocational, trade, business, or other career training school. In addition I also chose to examine only

This finding is basically consistent with research spanning the last fifty years (Terkla, 1981).

Persistence Model

College withdrawal is best understood within a framework in which different variables interact to produce or prevent withdrawal from college. My specific model (Figure 1) posits that dropping out is a function of student background, pre-college academic factors, occupational and educational aspirations, institutional characteristics, college performance, and financial assistance.

The variables which I include in this model are defined as follows:

Socioeconomic Status (SES) is a measure created from the NLS data by Riccobono et al., (1981). The raw SES measure resulted from a factor analysis of five components: father's education, mother's education, parents's income, father's occupation, and a household items index. The score ranges from -2.3373 to 1.9898 with a high score indicating high SES.

Race is treated as a dichotomous variable and is coded as "0" for non-whites and "1" for whites.

Sex is a natural dichotomy and is coded as "0" for males and "1" for females.

Aptitude is the average standardized score from four NLS base-year test scores: vocabulary, mathematics, reading, and letter groups. The range of scores was from 21 to 80, with a high score indicating high aptitude. The test scores were standardized across the sample with a mean of 50 and a standard

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those students who participated for the duration of the study (i.e. they answered the base-year questionnarie and all four follow-up questionnaries). Lastly, I eliminated those individuals from my subsample who did not have test battery information.

deviation of 10. This test battery was developed by ETS and the scores are highly correlated with corresponding SAT and ACT scores.

High School Grade Point Average (GPA) is an imputed average which was developed by ETS. It is derived from the grade point averages and/or percentile ranks for each student which were reported by the high schools. There were originally 14 categories ranging from A+ to below F. I have converted these categories to a four point scale with an A coded as a "4" and an F coded as "0".

Occupational Aspiration is an index which I created by classifying all occupations according to the number of years of higher educaton required for a specific occupation.[6] This aspiration was recorded at the time of high school graduation.

Degree Level Goal is the number of years of education beyond high school that the student plans to attain. This aspiration was recorded at the time of high school graduation.

College Performance describes the students' academic performance as measured by college grade point average. This measure is student reported, unlike high school GPA, and was converted to a four point scale, with an A coded as "4" and and F coded as "0".

Financial Aid is the student's college work-study, scholarships, or loans. It is treated as a dichotomous variable and is coded as "0" for no financial aid and "1" for receipt of some form of financial aid.

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6. Students were asked "What kind of work will you be doing when you are 30 years old?" There were sixteen different categories to choose from. Following is the coding which I developed: (1) Clerical; Craftsman; Homemaker; Laborer; Military; and Operative such as meatcutter, welder, or truck driver; Proprietor; Protective Service; Sales and Service such as private household worker, janitor, or waiter were coded as "0"; (2) Farm Manager and Technical such as draftsman, dental technician, or computer programmer were coded as "2"; (3) Manager/Administrator; Professional such as accountant, registered nurse, engineer or librarian; and School Teacher were coded as "4" and (4) Professional such as dentist, lawyer, scientist, or college teacher was coded as "8". I used the U.S. Department of Labor Dictionary of Occupational Titles to estimate the appropriate number of years of education.

Institutional Characteristics is a standardized variable which incorporates three major characteristics: 1) type of institution - two-year or four-year, 2) prestige ranking - elite or non-elite, and 3) control - public or private. These variables were originally coded as three separate dichotomous variables: "0" for two-year, "1" for four-year, "0" for non-elite "1" for elite, "0" for public and "1" for private.[7]

Persistence is treated as a dichotomous outcome and is coded as "0" for dropout and "1" for completer. The students in the prolonger category were eliminated from the analysis.[8]

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7. To create the new variable, I first ran the following regression:

Persistence = f(SES, Race, Sex, Aptitude, GPA, Occupational Aspiration, Degree Level Goal, Type of Institution, Prestige Ranking, Control, College Performance, and Financial Aid).

I did this in order to determine the beta coefficients for the type of institution, prestige ranking, and control variables. I then created the institutional characteristic variable by multiplying each variable by its beta coefficient and summing the variables. I created the following equation: Instchar = (.129 * Type) + (.028 * Prestige) + (.0345 * Control). I then standardized the variable so that it would have a mean of 50 and a standard deviation of 10.

8. If I had chosen to include the prolongers in the analysis, they would have had to be classified as either dropouts or completers. Classifying the prolongers as dropouts would make one set of variables appear important while classifying them as completers would make different variable appear important.

Path Analysis Results[9]

Socioeconomic status, race, and sex do not have strong direct effects on persistence behavior (refer to the revised model outlined in Figure 2).[10] Their effects are mainly

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9. The analysis of path coefficients is based on my interpretation of the standardized beta coefficients. My path analysis results were obtained by estimating the following structural equations:

Aptitude = f(Background);

High School GPA = f(Background, Aptitude);

Occupational Aspiration = f(Background, Aptitude, High School GPA);

Degree Level Goal = f(Background, Aptitude, High School GPA, Occupational Aspiration);

Institutional Characteristics = f(Background, Aptitude, High School GPA, Occupational Aspiration, Degree Level Goal);

College Performance = f(Background, Aptitude, High School GPA, Occupational Aspiration, Degree Level Goal, Institutional Characteristics);

Financial Aid = f(Background, Aptitude, High School GPA, Occupational Aspiration, Degree Level Goal, Institutional Characteristics, College Performance); and

Persistence = f(Background, Aptitude, High School GPA, Occupational Aspiration, Degree Level Goal, Institutional Characteristics, College Performance, Financial Aid).

10. After estimating the eight structural equations, I revised the model by eliminating all the non-signficant paths. I then estimated the new regression equations, using

indirect and are transmitted through other variables. Of the three, SES seems to have the greatest total effect on persistence.[11] For example, SES and race appear to have a strong effect on aptitude. While sex has a moderate effect on high school GPA and college performance. The effects of the background variables on degree level goal are disparate: race and sex have negative effects while SES has a moderate positive effect. The effects of race and sex are negligible. The negative relationship between SES and financial aid can be explained by the fact that a large proportion of the financial award is need-based. Therefore, one would expect students from families with lower incomes to receive more aid.

While there is a relatively high correlation between occupational aspiration and degree level goal (.57), the direct effects on persistence are strikingly different. Occupational aspiration has a very weak direct effect on attrition as compared to degree level goal which has the strongest direct effect. Although occupational aspiration has a much weaker direct effect it does have a relatively

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only those variables with intitially significant path coefficients.

11. Table 1 contains the standardized path coefficients (direct effects) as well as the zero-order correlation and the indirect causal effects. The $R^2$ values obtained for each equation are also presented in this table. These values range from .08 to .39, all of which are significant at the p(.001 level of significance.

strong indirect effect. In fact its indirect effect is three times as great as the indirect effect of degree level goal. As a result, their total effects on persistence are not as different as one might conclude from looking solely at the direct effects. Further examination of these two variables reveals additional differences. Degree level goal has a strong direct effect on both the institutional characteristic and college performance variables. Whereas, occupational aspiration has no significant direct effect. In both instances the total effect of degree level goal is twice as large as the total effect of occupational aspiration.

High School GPA, my measure of academic performance, has the second strongest direct effect on persistence. In fact, it has a much stronger direct effect that student's measured aptitude. Even though aptitude has no signifcant direct effect on persistence, it has the strongest indirect effect. Hence when one compares the total effects of the two variables one finds that they are the same. Another variable which one might expect to have a strong direct effect on persistence is college performance. In this particular analysis this notion proved to be false. College performance had a very weak direct effect on persistence. This could be partially explained by the self-reporting nature of the measure and the fact that the difference in the mean GPAs of completers (2.9) and dropouts (2.6) was not

very great. As a result high school GPA proved to be the better predictor of persistence than first year college performance. It is interesting to note that neither high school GPA nor college performance had a significant direct effect on financial aid. This is in all likelihood attributed to the fact that most financial aid awards are based on need rather than merit or academic ability.

The institutional characteristics variable had a modest direct effect on persistence. It is interesting to note the effect of this variable on first year college performance. The negative direct effect implies that students who attend the more prestigious, four-year private instituitons tend to receive lower grades than those who attend non-prestigious, public two-year institutions.

The financial aid variable, which is of particular importance because it is the one variable in this model which can be manipulated and is the primary focus of many policy dicussions, had the third strongest direct effect on persistence and the fifth strongest total effect on students' decisions to either remain at higher education institutions or withdraw.

Controlling for all other variables, one finds that of those receiving aid, approximatley 56.5 percent were more likely to complete their degrees as compared to non-recipients whose chance of completion was only about

43.5 percent. However, when one examines the total effects of all the independent variables on persistence, the overall effect of financial aid is not as dramatic. This can be partially explained by the structure of my model. I designed the model in such a way that there are no intervening varialbe between financial aid and persistence. Consequently, there are no measurable indirect effects. Also, it was quite unexpected to find the large indirect effects of both aptitude and occupational aspiration. Even though the total effect of financial aid is only moderately strong it is important to consider because it does have a positive effect on persistence and a it is the one variable in the policy debate which can "theoretically" be altered.

Summary

Several different conclusions emerge from my analysis. The first and possibly the most important , is that the receipt of financial assistance is relevant to a decision whether or not to remain in college. In other words, there is a significant relationship between college completion and receiving financial aid. This study demonstrates, even after controlling for all other variables, that students receiving aid were more likely to complete their degrees than those individuals who did not receive aid. Moreover, the path analysis results show that receipt of financial aid has the third strongest direct effect on persistence. The

only two variables which have stronger direct effects than financial aid are high school GPA and degree level goal.

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